Dave Scott

THE SPRUCE BARK BEETLE INFESTATION

IN NORTHERN IDAHO AND WESTERN MONTANA

Control and Salvage Plans

for 1956

PROGRESS REPORT

JANUARY 1956

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PLANS FOR 1956
CONTROL AND SALVAGE OF SPRUCE BARK BEETLE INFESTATION
Northern Idaho and Western Montana

Missoula, Montana

Progress Report January 1956

This report was prepared in the Regional Office of the Northern Region, Missoula, Montana. The Division of Timber Management, Division of Engineering, personnel of Clearwater, Coeur d'Alene, Colville, Flathead, Kaniksu, Kootenai, Lolo, and St. Joe National Forests, and Missoula Research Center of the Intermountain Forest and Range Experiment Station collaborated. The timber industry has continued to support and actively carry out the logging-for-control, the related trap tree, and the road programs. Industry's cooperation is vital to the successful continuation of the control and salvage program.

In 1952 it was predicted that 3,700 million board feet of green spruce could be saved from the ravages of the spruce bark beetle if appropriated funds were made available for a logging-for-control program. Current survey data indicates a residual green spruce volume of about 4 billion board feet within the original 7 1/ epidemic national forests after the 1955 flight of beetles. Much of the remaining spruce is in the younger-age classes or mature spruce intermixed with other species.

In spite of the spruce beetle epidemic, the regional spruce picture appears encouraging. Although some of the individual working circles have been heavily infested and spruce volumes depleted, indications are that a substantial sustained cut of spruce can be expected in future years. However, the allowable annual cuts will have to be developed working circle by working circle.

1/ Due to boundary changes in 1954, the Colville and Coeur d'Alene forests were added and the Cabinet dropped from report summaries. The spruce areas on the present eight forests are the same as on the original seven national forests.

I. STATUS OF INFESTATION

Entomological Features

The Engelmann spruce beetle epidemic that broke out in 1952 from beetle broods which developed in windthrown timber caused extensive killing in mature Engelmann spruce timber in western Montana and northern Idaho. Over 400 areas of Engelmann spruce type were infested by the beetle to various degrees. Generally, the pure spruce stands were hardest hit, many suffering nearly complete destruction. The infested acreage did not materially change during the succeeding three years, but the intensity of damage varied. The mature spruce timber in many areas of heavy infestation was nearly depleted by the end of 1953. Where the initial attack was light the infestation continued on a more gradual scale, often increasing in severity. The overall trend of the outbreak was a sharp increase which reached its peak in 1953 then declined during 1954. This trend was continued with further reductions occurring in 1955.

After the spruce bark beetle outbreak was discovered in 1952, surveys were initiated to obtain the volume of loss. These data showed that a serious epidemic condition existed within and adjacent to eight national forests west of the Continental Divide.

The 1955 survey results indicate a continued lessening in the severity of the damage. A significant reduction in 1955 damage occurred in areas in which no control measures were undertaken as well as in areas where control was carried out.

In measuring the trend of the infestation, forest entomologists sampled areas where the natural course of its development was not disturbed by applied control efforts. Using an average board-foot volume per acre killed by beetles in 1952 as an index of 1.0; the index of infestation in 1953 was 1.9; in 1954, 1.6; and in 1955, 0.7. The actual trend of the infestation in all areas would doubtless be at a lower index figure for 1955 because of the influence of logging control on many areas.

Spruce Volume Loss

Over two billion board feet of Engelmann spruce have been killed since the discovery of the spruce bark beetle outbreak in 1952. On national forest land the 1955 flight of beetles has added 292 million board feet of infested spruce to the 1,821 million already killed. Table I compares this 292 million board feet loss to the 514 million board feet in 1954, 770 million board feet in 1953, and 537 million board feet in 1952. It is now estimated that the beetles will kill an additional 115 million board feet of spruce in 1956. Much of this 115 million board feet will be within new compartments and uncontrolled units.

TABLE I. INFESTED SPRUCE VOLUME BY FLIGHT YEARS ON EIGHT FORESTS
(National Forest Ownership Only)

Year	1952	1953	1954	1955	1956	Total
Nonreserved	474	674	405	254	95*	1,902
Reserved	63	96	109	38	20*	326
Total	537	770	514	292	115*	2,228

*Estimated figures

On state and private forest land there is also a decline in the 1955 damage.

Logging, trap trees, woodpeckers, parasites, and low temperatures, or a combination of these factors, have reduced the present infestation to endemic levels in many individual compartments. Even a greater decline in the infestation occurred where mature spruce in pure stands had been killed, because the supply of suitable host material had been exhausted. Compartments with more than 80% of the original green volume insect-killed were considered "burned out." Most of these units have been dropped from compilation, but past infested volumes are still carried in the statistics. There is small-size, green spruce growing in many of these compartments which has not been included in the total residual green volume figure.

II. SPRUCE BEETLE CONTROL ACCOMPLISHMENTS

Logging has been the principal method of controlling the spruce bark beetle. By the end of the 1955 production year (June 30, 1956) nearly a billion and a half board feet of infested and salvage volume will have been logged.

Trap trees have been used as an adjunct to logging. During the 1953-54-55 trap tree program, about 60,000 trees were felled and subsequently logged, burned, or sprayed with insecticide to dispose of the trapped beetles. All but 16,000 of these trees were disposed of by logging.

Table II shows the volumes removed by logging from 1952 through 1955. Chart I shows, graphically, the trend of logging-for-control and salvage.

Table II. Spruce Logged on Eight Epidemic Forest Units
(Million board Feet)

Ownership	Year [1]	Infested	Salvage [2]	Green	Total
NF	1952	75	9	24	108
All other [3]		20	3	41	64
Subtotal		95	12	65	172
NF	1953	115	39	40	194
All other		49	18	33	100
Subtotal		164	57	73	294
NF	1954	204	86	58	348
All other		54	17	34	105
Subtotal		258	103	92	453
NF	1955 [4]	116	215	74	405
All other		14	10	4	28
Subtotal		130	225	78	433
NF	1956 [4]	57	127	79	263
All other		5	28	46	79
Subtotal		62	155	125	342
NF	1952	567	476	275	1318
All other	to	142	76	158	376
Subtotal	1956	709	552	433	1694

1/ Production year July 1, 1952, to June 30, 1953.
2/ Salvage spruce are trees one year after attack and usually contain spruce beetle population when logged.
3/ Private, state and other nonnational forest ownerships.
4/ Estimated volumes to be logged.

During the period July 1, 1954, to June 30, 1955, the spruce beetle control program for national forest lands cost $537,838. A summary follows:

Supervision, planning, reports and records - ranger district, supervisor office, and regional office organizational levels. .	$205,067
Detection, operational and maintenance surveys. Sales preparation over and above normal sales work.	101,169
Designation of infestation areas, spotting infested trees, marking trap trees, and the checking of infested tree felling, treatment, and logging.	207,328
Forest Insect Laboratory surveys.	24,274
Total	$537,838

In the current (1956) fiscal year the spruce beetle program on national forest land will require about $365,000 for the same classes of work as indicated above.

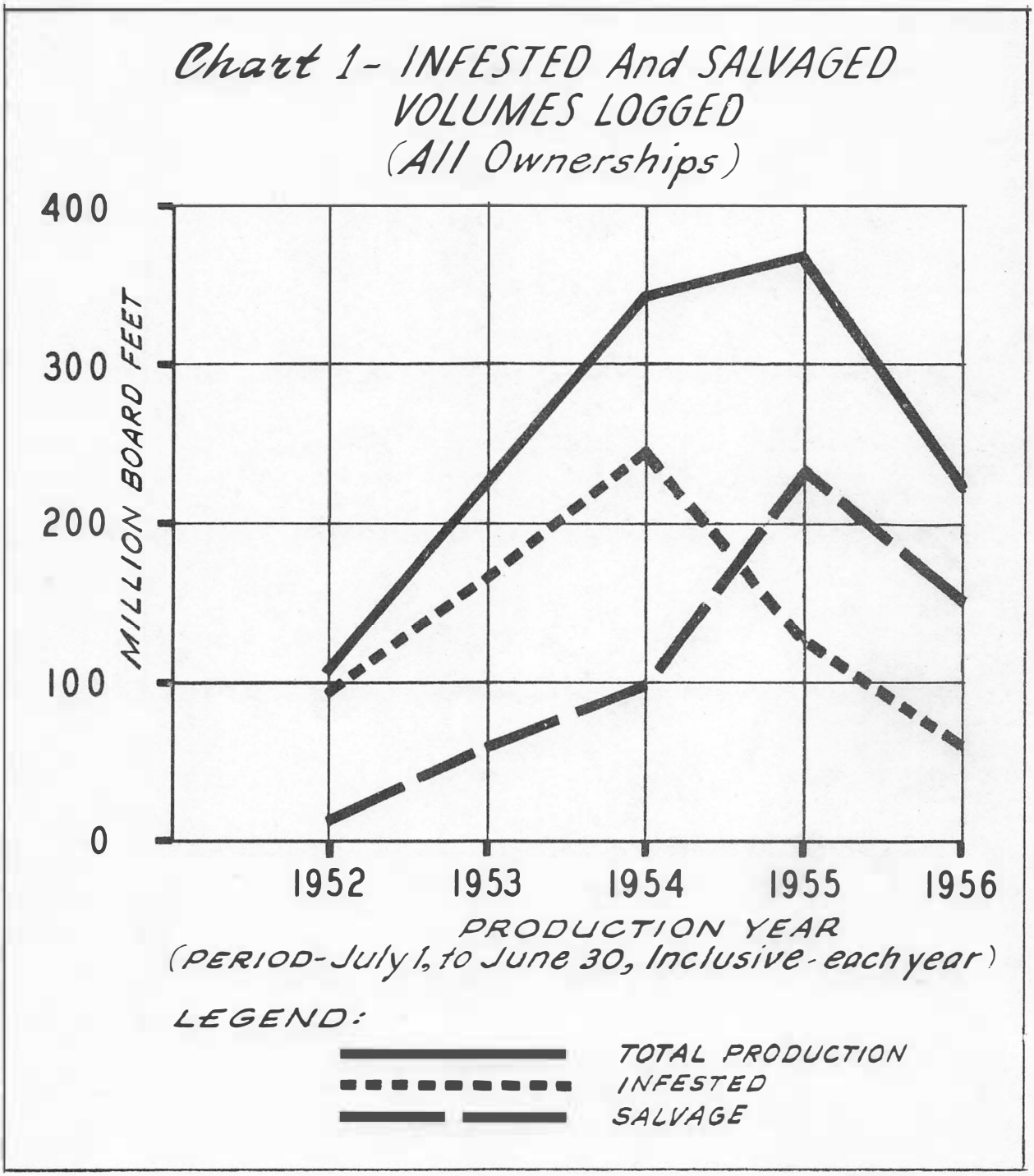
Chart 1- INFESTED And SALVAGED VOLUMES LOGGED
(All Ownerships)
400
300
200
100
0
MILLION BOARD FEET
1952
1953
1954
1955
1956
PRODUCTION YEAR
(PERIOD-July 1, to June 30, Inclusive-each year)
LEGEND:
TOTAL PRODUCTION
INFESTED
SALVAGE

III. SPRUCE ACCESS ROADS

Federal programmed spruce access roads totaling 437.4 miles have been built at a cost of $9,268,469. Of this amount $256,848 was private forest owners' share of primarily Federal projects involving mixed ownership. To date 518 million feet of spruce have moved over these roads. These completed Federal access roads, together with several hundred miles of well-built operator main-haul roads, will provide improved accessibility for logging, protection, and recreation.

Table III. Federal Road Construction
Spruce Bark Beetle Control and Salvage
(Final Report)

Miles	Total Cost	"Bug" Road Appropriation	Regular Road Fund	Private Cooperation
437.4	$9,268,469	$8,428,500	$583,121	$256,848

IV. LOGGING-FOR-CONTROL AND SALVAGE PROGRAM IN 1956

Logging continues to be the only economical method of control. Where the infestation has continued to kill green trees in 1955, logging must be continued at a high rate of production in 1956. Even in areas where the 1955 damage has lessened in severity, the cutting of salvage spruce 1/ should continue at a rapid rate to dispose of as many insects as possible and to utilize the timber before deterioration destroys the greatest values (Table II). Therefore, logging-for-control should of necessity be continued only at a slightly reduced level during F.Y. 1956 (Chart I). Where the infestation is no longer building up, the logging effort will be directed toward the salvage of beetle-killed timber.

As an adjunct to logging, trap trees have a definite place in the control program. However, present plans include only trap trees that can be felled by operators and logged from existing operations without excessive cost.

It is estimated that during the period July 1, 1956, to June 30, 1957, it will be necessary to remove 57 million board feet of infested spruce and 127 million board feet of salvage from national forest land alone. From forest land of other owners it is estimated that 5 million infested and 28 million salvage 1/ spruce should be cut during the same period. Considerable beetle-killed and infested spruce remains to be logged in existing timber sales. Insect control sales preparation will be given priority over regular sales on forests where insect infestations exist. However, effort will be made to integrate the spruce beetle control and salvage program for 1956 with the regular sales program.

A continuation of the logging-for-control sales program demands adequate, accurate insect and volume data. To obtain this information, continuation of maintenance 2/ and operational surveys will be necessary. Supervisory work and planning must also be continued in proportion to the overall control program. Following is a detailed estimate of financial needs for control work on national forest lands for the ensuing year (F.Y. 1957 pest control funds).

1/ Salvage spruce are trees one year after attack and usually contain spruce beetle population when logged.

2/ A maintenance survey is a recurrent survey of an area that has been covered by an operational survey or a spruce area that has been classified as endemic by a past detection survey.

Supervision, planning, reports and records - ranger district, supervisor office, and regional office organizational levels.	$ 80,000
Detection, operational, and maintenance surveys. Sales preparation of infested spruce over and above normal sales work.	90,000
Designation of infested areas, spotting, marking trap trees, and checking of infested-tree felling, treatment, and logging	60,000
Forest Insect Laboratory survey (population trend, and checking the effectiveness of logging-for-control)	15,000
Contingent for unforeseen revisions in the program.	25,000
Total	$270,000

V. SUMMARY OF CONDITIONS, PROGRESS AND PLANS

This section contains a statistical summary and a brief narrative statement of conditions for each operating block. The blocks are subdivisions of the region, such as large drainages, with common bark beetle control problems. They are used for convenience in planning and reporting. The block statistic were derived from an analysis of the spruce compartments in each block. Infested spruce volumes are given for each production year 1/ by ownership. The next entries are volumes logged by ownership. A 1956 infestation estimate is given with the minimum logging goal established 2/.

A summary of block statistics for the spruce compartments in the eight epidemic forests in the program follows:

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

TOTAL SPRUCE VOLUME, July 1, 1952

Reserved 3/ :	N.F., 1,049;	Non-N.F., 0;	Total, 1,049
Nonreserved :	N.F., 4,377;	Non-N.F., 948;	Total, 5,325
Grand Total :	N.F., 5,426;	Non-N.F., 948;	Total, 6,374

Production Year 1/	INFESTED SPRUCE VOLUME (Reserved and Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	537	80	75	20
1953	770	111	115	49
1954	514	76	204	54
1955	292	40	116 2/	14 2/
1956 2/	115	10	57	5
Total	2,228	317	567	142

Spruce beetle conditions within the Selway-Bitterroot Wilderness Area remain about the same as previously reported. The infestation on the western part has about run its course. Most of the isolated spruce stands there have "burned out." In the central part the beetle infestation remains at a high level, although recent surveys indicate a reduction in its severity.

The spruce beetle infestation within the Bob Marshall Wilderness Area and Cabinet Mountains Wild Area has killed much of the pure spruce type. The mixed spruce types which generally predominate are lightly infested.

In general, the spruce beetle infestation within the Mission Mountains Wild Area is at an endemic level, but several drainages have spot infestations that have increased in severity.

No major control effort has been applied to these areas nor is any proposed at this time. However, they will be kept under observation.

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated
3/ This includes the Bob Marshall and Selway-Bitterroot Wilderness Areas; also Mission Mountains and Cabinet Mountains Wild Areas for which no block statements have been prepared.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

CEDARS Operating Block, CLEARWATER Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 171.9; Non-N.F., 44.8; Total, 216.7

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved) Total Infested N.F.	Total Infested Non-N.F.	Logged N.F.	Logged Non-N.F.
1952	11.3	3.7	0	0
1953	26.9	8.0	1.2	0.4
1954	51.2	19.0	0.6	0.8
1955	21.2	6.7	2.4 2/	4.2 2/
1956 2/	8.0	1.6	1.6	1.0
Total	118.6	39.0	5.8	6.4

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

Seven compartments in this block contain the majority of the original spruce volume. Four of these are included in the long-term sale with the Diamond Match Company. Heavy infestations during 1953 and 1954 have reduced the green spruce volume in strictly spruce type to a fraction of the original. Most of the green mature spruce left in the Cedars block after the 1955 flight occurs intermingled with timber of other species.

The main areas of spruce type are characterized by mixed ownership of national forest and Diamond Match Company lands. Logging of infested and salvage spruce was carried on within lands of both ownerships. Early in 1955 a sale was made under a two-year contract for the removal of 9 million board feet of spruce from national forest lands within this block.

After the 1955 flight the spruce beetle was found in western white pine. Generally, these infested white pine trees are confined to areas adjacent to "burned out" spruce areas.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

CLEARWATER Operating Block, CLEARWATER Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 77.6; Non-N.F., 2.4; Total, 80.0

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	3.7	0.2	0	0.1
1953	5.0	0	0	0
1954	2.1	0	0	0
1955	5.7	0	0.7 2/	0
1956 2/	3.6	0	1.0	0
Total	20.1	0.2	1.7	0.1

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

The Clearwater block comprises the west half of the forest. Spruce stands are generally at lower elevations than those in the eastern half. In 1952 numerous epidemic centers were found throughout the block. Except in two compartments, spruce volumes of sufficient density per acre to sustain a beetle epidemic occur only in isolated patches or as stringer types along streams. In many compartments with stringer-type spruce, the epidemic appears to be subsiding.

Fifty percent of the spruce volume in this block occurs in two compartments where there are large areas of infested spruce. Logging-for-control is in progress to curb the epidemic in these areas. A spruce access road into these compartments was completed in August of this year. Although actual hauling of logs did not begin until August, sawyers began felling spruce on road rights-of-way and in areas adjacent to the roads four or five weeks prior to the 1955 flight. The cut green spruce acted as excellent traps and were hauled out and milled at a new sawmill located at the mouth of Cold Springs Creek, eight miles from the sale area. A very rapid buildup of woodpeckers and beetle parasites was observed this year in these areas.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

LOCHSA Operating Block, CLEARWATER Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 98.6; Non-N.F., 0; Total, 98.6

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	7.8	0	0	0
1953	16.0	0	0	0
1954	20.7	0	0	0
1955	11.9	0	0	0
1956 2/	5.2	0	0	0
Total	61.6	0	0	0

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

Because of the remoteness of the spruce areas in this block, control by logging was not feasible. Surveys and studies in 1953 showed that the immense and costly job of road construction would delay access into these areas until too late to do any effective control. This block is subdivided into reserved and nonreserved areas, the former being that portion lying south of the Lochsa River within the Selway-Bitterroot Wilderness Area. Surveys in the nonreserved portion show that these high-volume spruce areas are largely "burned out." The major remaining volume of green spruce exists intermingled with other types. In the Selway-Bitterroot Wilderness section, where most of the timbered areas are true spruce type, damage continues to be heavy.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

ST. REGIS Operating Block, COEUR D'ALENE Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 61.2; Non-N.F., 0; Total, 61.2

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	6.1	0	1.6	0
1953	11.5	0	2.1	0
1954	4.6	0	4.5	0
1955	1.6	0	0.6 2/	0
1956 2/	2.6	0	2.5	0
Total	26.4	0	11.3	0

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

The spruce bark beetle control program has been confined to the St. Regis block. Of the eight spruce compartments, only one continues to be endemic.

A large percentage of the mature spruce in the pure stands of other compartments has been logged or killed by the spruce beetle. The timber sales program for next year will be primarily salvage operations. One pulp sale has been made for dead spruce. However, there is a volume of about 10 million board feet of green spruce in younger-age classes within two other compartments.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

SULLIVAN LAKE Operating Block, COLVILLE Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 44.8; Non-N.F., 3.6; Total, 48.4

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	0.9	T	0	0
1953	2.2	0.2	0.3	0.1
1954	4.4	0	0	0
1955	0.9	0	0.3 2/	0
1956 2/	0.2	0	0.1	0
Total	8.6	0.2	0.7	0.1

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

Surveys indicate five of the six compartments which were epidemic in 1953 are now endemic. Survey of the Salmo compartment indicates epidemic condition around a few former "hot spots." During F.Y. 1956 infested spruce will be removed from the lower part of the drainage by two timber sales.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

CORAM Operating Block, FLATHEAD Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 297.2; Non-N.F., 0.3; Total, 297.5

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	9.0	0	0	0
1953	6.2	0	T	T
1954	9.4	T	0.4	0
1955	8.2	0	2.1 2/	0
1956 2/	5.2	0	1.6	0
Total	38.0	0	4.1	0

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

Much of the infested spruce in the Coram block is inaccessible. To date 40 miles of roads have been built by timber purchasers.

The 1955 spruce bark beetle surveys indicate a general decline in infested spruce volume. However, several infested spots do exist in some compartments. Where these compartments can be reached economically they will be logged next year.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

GLACIER VIEW Operating Block, FLATHEAD Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 543.5; Non-N.F., 85.0; Total, 628.5

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F	Non-N.F.	N.F.	Non-N.F.
1952	13.5	1.3	0.7	0
1953	30.2	1.8	3.1	0.3
1954	24.6	0.7	20.6	1.3
1955	18.2	0.7	13.9 2/	0.1 2/
1956 2/	4.6	0.2	3.1	0.1
Total	91.1	4.7	41.4	1.8

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

This block is the largest spruce area in the Flathead National Forest.

Since the inception of the control program in 1952, 90 million feet have been logged. About 90 percent of this volume has been hauled over access roads constructed or reconstructed from appropriated funds.

Insect surveys made during the summer of 1955 indicate that on most areas the spruce bark beetle infested volume has declined. Only two areas have developed spot infestations that threaten large areas of green spruce. Logging-for-control will be completed on these areas next year.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

KALISPELL Operating Block, FLATHEAD Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 98.1; Non-N.F., 91.6; Total, 189.7

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	4.5	1.7	T	0.3
1953	3.2	2.4	0.6	0.5
1954	1.4	1.3	0.5	0.7
1955	1.0	1.0	0.8 2/	0.5 2/
1956 2/	0.8	T	0	0.2
Total	10.9	6.4	1.9	2.2

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

The spruce in this block occurs mixed with other species. Consequently, there has not been the percentage of volume loss that has occurred in other blocks.

In general, the spruce beetle infestation has returned to endemic conditions.

To date 20 million feet of spruce have been logged. Much of this was green from road rights-of-way and from clear-cut patches. Logging will continue in areas where spot infestations threaten residual green spruce.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

SWAN Operating Block, FLATHEAD Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 156.9; Non-N.F., 116.1 2/; Total, 273.0

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	6.8	4.0 2/	1.3	0.2
1953	8.4	8.1 2/	3.2	1.2
1954	4.7	11.5 2/	3.7	3.2
1955	5.2	2.9 2/	2.1 3/	1.5 3/
1956 3/	1.5	2.3	0.6	0.2
Total	25.6	28.8	10.9	6.3

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Includes nonnational forest ownership within the Mission Mountains Wild Area.
3/ Estimated

The principal spruce areas in the Swan Valley are under the administration of the Forest Service, Northern Pacific, and State of Montana in a checkerboard pattern. Logging control action has been initiated on all major spruce areas known to be epidemic in 1954 on which such action was believed to be economically feasible. The 1955 insect surveys showed only a slight decline over those of 1954, but a substantial decrease over those reported in 1953. Over 60 miles of main roads have been constructed or reconstructed by Forest Service, Northern Pacific, and state timber sale purchasers, at an estimated cost of $170,000. A total all-species volume of more than 60 million feet (over 20 million feet of spruce) from national forest lands has been hauled over these roads since 1952. The 1956 logging program will be aimed at cleaning up all spruce areas on which control action has been taken, and salvage of merchantable dead spruce where feasible.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

BONNERS FERRY Operating Block, KANIKSU Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 305.8; Non-N.F., 89.7; Total, 395.5

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	27.8	10.8	6.1	4.7
1953	52.8	28.9	16.8	11.2
1954	13.4	1.4	18.0	8.0
1955	19.0	2.8	11.3 2/	2.0 2/
1956 2/	12.1	0.9	11.2	0.6
Total	125.1	44.8	63.4	26.5

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

This block remains the largest and most important on the Kaniksu from the standpoint of spruce-type area, spruce volume, and volume of infestation. Control action is now being done by logging in all compartments where it is economically feasible. Infested spruce in 19 compartments has been covered by control sales. Maintenance and operational surveys indicate that control sales may be necessary in five additional compartments in order to control small epidemic spots of infestation. Federal access roads have been completed in Myrtle Creek and Canuck Creek. Operator-built roads are progressing satisfactorily as needed by the control program. Surveys in 1955 indicate a general downward trend in infestation, especially in areas that have been borderlined between endemic and epidemic. Heavy logging will be necessary through 1956 in order to complete control and salvage objectives.

Some 30 million board feet of spruce remain to be logged in existing Forest Service control and salvage sales. An additional 15 million are planned for sale in 1956. Present plans call for logging 40 million board feet of spruce in 1956 from the existing and proposed sales.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

BOUNDARY Operating Block, KANIKSU Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 190.0; Non-N.F., 8.1; Total, 198.1

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved) Total Infested N.F.	Non-N.F.	Logged N.F.	Non-N.F.
1952	6.2	0.3	0	0
1953	12.9	0.3	0	0
1954	5.8	0.2	1.1	0
1955	11.8	0.1	1.4 2/	2.0 2/
1956 2/	8.4	T	3.0	0
Total	45.1	0.9	5.5	2.0

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

All control sales have been made where it is possible to log economically. Logging has not progressed in 1955 as rapidly as planned owing to wet weather and labor shortage. There was no trap tree activity in 1955, and none is planned in 1956. Surveys in 1955 indicate a downward trend in infestation in areas of lighter infestation. Eight compartments remain endemic, but the infestations present continue to require surveillance. Existing sales contain 4 million board feet of spruce, which will be logged in 1956.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS.
(All Volumes in Million Board Feet)

CLARK FORK Operating Block, KANIKSU Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 40.7; Non-N.F., 0.1; Total, 40.8

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	4.1	0	0.1	0
1953	5.3	0	0.6	0
1954	2.1	0	0.1	0
1955	0.4	0	0.3 2/	0
1956 2/	1.6	0	1.4	0
Total	13.5	0	2.5	0

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

The 1955 logging program, in all compartments, was curtailed this fall because of wet weather and early snows. Operator-built road construction is behind schedule.

Except in the Vermillion River compartment, much of the mature spruce in this operating block has been killed by the spruce beetle.

As an adjunct to logging-for-control in Vermillion River, 1,400 trap trees were felled. All trap trees were attacked and reduced the present infestation to an endemic level.

Six-hundred trap trees were chemically treated in 1955. The remaining traps will be logged in the summer of 1956.

Existing sales contain 16 million board feet of spruce. It is planned to log 11.5 million of this amount in 1956.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

LIGHTNING Operating Block, KANIKSU Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 43.6; Non-N.F., 0; Total, 43.6

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	6.2	0	0.1	0
1953	15.5	0	0.3	0
1954	2.6	0	3.3	0
1955	4.5	0	2.6 2/	0
1956 2/	2.0	0	1.5	0
Total	30.8	0	7.8	0

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

All Federal access roads in this block have been completed. Operator-built roads are being completed fast enough to permit planned control logging. All major infestations are now covered with sales, with the exception of Bear Creek. A control sale is planned for 1956 in this drainage. Owing to wet weather, 1955 logging did not reach planned objectives. Control logging has been completed in three compartments.

The 1956 goal is to log 16 million board feet of spruce. Existing control sales have an uncut balance of 10 million board feet.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

PRIEST RIVER Operating Block, KANIKSU Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 46.6; Non-N.F., 0; Total, 46.6

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	3.0	0	0.1	0
1953	1.6	0	2.8	0
1954	0.4	0	0.4	0
1955	0.5	0	T 2/	0
1956 2/	0.1	0	0.1	0
Total	5.6	0	3.4	0

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

Infestation in the scattered spruce areas of this block has been substantially controlled. The Boulder-Beaver compartments still remain endemic as a result of control logging and a trap tree program in 1954. Logging-for-control has not progressed in three compartments as planned owing to wet weather, but no buildup in the present infestation has been observed. All other compartments are endemic.

The 1956 goal is to log one million board feet of spruce. Existing control sales have an uncut balance of one million board feet.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

LIBBY-TROY Operating Block, KOOTENAI Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F. 498.2; Non-N.F., 42.2; Total, 540.4

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	91.3	1.5	53.7	1.5
1953	124.3	2.1	33.2	0.4
1954	60.1	0	36.7	0.4
1955	10.4	0	8.0 2/	0
1956 2/	2.4	0	1.8	0
Total	288.5	3.6	133.4	2.3

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

At the end of the production year (June 30, 1955) 58% of the total spruce volume logged on the forest had come from the Libby-Troy block. Cutting in this block will remain at approximately the same level for the production year ending June 30, 1956. This will probably be the peak year for cutting in all blocks on the forest. The infestation this year was characterized by small "hot spots" within compartments where a high percentage of trees was attacked but the infestation percentage, when applied to the entire compartment, was relatively low. A few sales will be made to take care of "hot-spot" infestations.

Compartments which were logged in 1952 and 1953 remained relatively free of infestation. However, one compartment logged in 1953 was heavily attacked this year. These attacks occurred during three or four very hot days in June.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

TOBACCO Operating Block, KOOTENAI Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 320.2; Non-N.F., 0; Total, 320.2

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	31.1	0	3.7	0
1953	43.4	0	10.6	0.5
1954	12.8	0	18.8	0.7
1955	6.1	0	5.0 2/	0
1956 2/	2.8	0	2.5	0.3
Total	96.2	0	40.6	1.5

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

All compartments in the Tobacco block show a substantial decrease in infestation in 1955. A large percent of the trap-tree program on the Kootenai has been concentrated in this block. There seems to be some evidence that trap trees in low infestation areas give satisfactory results. Trap trees were felled in nine compartments. In all but two compartments the sale and logging program has been able to cope with the infestation. With the completion of the Wigwam access road, logging in this block should be about 25% greater during the production year ending June 30, 1956. Only one area in this block shows other than an endemic condition. This area in Wigwam compartment is now under contract.

Approximately 31 million board feet of spruce will be logged during the production year ending June 30, 1956. This will be the peak year for this block.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

YAAK Operating Block, KOOTENAI Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 559.3; Non-N.F., 0; Total, 559.3

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	126.6	0	0	0
1953	168.3	0	8.8	0
1954	69.7	0	39.1	0.7
1955	29.9	0	25.1 2/	0
1956 2/	3.6	0	3.0	0.1
Total	398.1	0	76.0	0.8

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

This block still remains the major spruce problem area of the forest. The completion of access roads in this block has accelerated the logging-for-control program which will probably peak at 75 million for the production year ending June 30, 1956. All compartments show some decrease in infestation, but all are still in epidemic state. Twenty-six active sales in the block will, in most cases, take all the infested timber and a large amount of salvage spruce. Only three of the twenty-one compartments now being carried on summary sheets show promise of a substantial residual volume. Salvage of dead spruce from this block will increase with better pulp marketing conditions.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

POWELL Operating Block, LOLO Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 353.8; Non-N.F., 221.0; Total, 574.8

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	27.8	11.2	1.6	0.3
1953	48.9	21.6	7.9	6.1
1954	47.0	23.1	18.1	9.6
1955	34.0	14.5	18.9 2/	3.0 2/
1956 2/	15.5	2.1	14.6	1.5
Total	173.2	72.5	61.1	20.5

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

This block continues to be the most important spruce area on the Lolo Forest. It is producing major amounts of infested spruce from private lands as well as from national forest lands. Control efforts were completed on the Lolo District portion of the block, but one operator is still engaged in a salvage operation of minor volume. Approximately 28% of the original volume of spruce on this area is still green. Although most of the mature spruce on two compartments was insect-killed and logged out, a great amount of pole-sized or immature timber remains.

Control efforts are in all stages of execution and completion on the Powell District section of this block. All portions of the 75-million-foot Lower Powell sale are opened up and have had some control logging done. Deep, early fall snows indicate that little will be accomplished this winter. The spruce in upper Cayuse Creek is 80% dead where the infestation could not be controlled because of economic considerations.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

SEELEY LAKE Operating Block, LOLO Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 63.7; Non-N.F., 60.6; Total, 124.3

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	3.6	3.9	0.2	0.5
1953	2.5	3.1	4.6	4.7
1954	5.0	6.9	6.1	9.4
1955	3.3	2.1	1.4 2/	1.0 2/
1956 2/	1.1	0.6	0.5	0.4
Total	15.5	16.6	12.8	16.0

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

Control operations on this block are largely completed. Some spots of infestation increased in 1955, apparently due to a two-year cycle in insect development. Because of these "hot spots", additional limited control and salvage sales will be made in 1956. Small areas of new infestation, generally interspersed with or adjacent to private timber, continue to be found and will contribute moderate volumes to spruce logging next year.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

SUPERIOR Operating Block, LCLO Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 33.0; Non-N.F., 8.1; Total, 41.1

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	6.7	1.4	T	0
1953	8.7	2.6	3.1	0
1954	9.2	1.0	4.1	2.0
1955	8.4	0.4	5.3 2/	0
1956 2/	1.8	T	1.5	0
Total	34.8 3/	5.4	14.0	2.0

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated
3/ Some original green spruce volumes were based on extensive survey data. Recent intensive surveys indicate 5.9 million board feet of green spruce remain in this block, even after the accumulated infested volume has been deducted.

A control and salvage logging operation is underway on this block. Beetle populations, which appeared to have declined previously, did not increase last year. Future spruce sales in this block will be mainly for salvage.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

THOMPSON FALLS Operating Block, LOLO Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 26.3; Non-N.F., 2.2; Total, 28.5

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	2.5	0	0.1	0
1953	3.0	0	0	0
1954	5.9	0	3.8	0
1955	1.9	0	0.9 2/	0
1956 2/	0.5	0	0.4	0
Total	13.8	0	5.2	0

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

Three control sales will be completed in 1956. Because a new epidemic infestation was discovered in 1955, one additional sale has been prepared and advertised. No other timber sales are planned for control of the spruce beetle at this time.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

FISHHOOK-LITTLE NORTH FORK Operating Block, ST. JOE Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 221.5; Non-N.F., 131.8; Total, 353.3

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	41.5	24.8	6.1	11.8
1953	41.0	21.7	13.9	19.5
1954	20.2	3.3	17.5	13.0
1955	28.8	6.8	10.1 2/	2.0 2/
1956 2/	7.4	1.8	4.4	0.3
Total	138.9	58.4	52.0	46.6

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

This is one of the most important spruce blocks within the forest. However, most of the spruce stands are now heavily infested or dead.

About 17 million board feet of spruce remain to be cut on existing sales. Three additional spruce sales are planned for this block during 1956 totaling approximately 14 million board feet. It is planned to log approximately 20 million board feet of spruce from national forest sales in this block during 1956, most of which will be salvage.

Fifty-five million feet of national forest spruce had been removed by December 31, 1955.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

LOWER ST. JOE Operating Block, ST. JOE Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 60.5; Non-N.F., 28.6; Total, 89.1

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	19.9	8.8	0	0.5
1953	21.9	8.3	1.7	3.8
1954	17.8	6.3	5.5	2.5
1955	2.6	1.7	2.0 2/	0
1956 2/	0.4	0.4	T	0.3
Total	62.6 3/	25.5	9.2	7.1

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated
3/ Some original green spruce volumes were based on extensive survey data. Recent intensive surveys indicate 8.4 million board feet of green spruce remain in this block, even after the accumulated infested volume has been deducted.

The principal spruce areas within this block are found in the Homestead, Daveggio, and Boulder compartments. These compartments were heavily beetle infested early in the epidemic.

Twenty million feet of national forest spruce were removed by December 31, 1955. Approximately 11 million feet of spruce on existing sales remain to be removed, practially all of it salvage. The Bussel Creek and Hobo-Cornwall compartments are relatively light in infestation, so no control action is planned. The other spruce stands are generally scattered and/or inaccessible.

SUMMARY OF CONDITIONS, PROGRESS AND PLANS
(All Volumes in Million Board Feet)

UPPER ST. JOE Operating Block, ST. JOE Forest

TOTAL SPRUCE VOLUME, (Nonreserved), July 1, 1952
N.F., 64.3; Non-N.F., 12.0; Total, 76.3

Production Year 1/	INFESTED SPRUCE VOLUME (Nonreserved)			
	Total Infested		Logged	
	N.F.	Non-N.F.	N.F.	Non-N.F.
1952	12.3	5.9	0	0
1953	13.8	2.2	0	0
1954	9.5	0.9	1.0	0
1955	18.6	0.8	0.3 2/	0
1956 2/	3.8	0.2	0.3	0.1
Total	58.0	10.0	1.6	0.1

1/ Production year 1952 is from July 1, 1952, to June 30, 1953, etc.
2/ Estimated

The West Fork of Bluff Creek compartment has been developed by the joint efforts of the Forest Service and the private landowner. Seven million feet of spruce had been removed by December 31, 1955. Two million feet of spruce still remain to be removed in this sale.

The remaining spruce stands in this block are on the north side of the St. Joe River. In general, these stands are small in size and scattered over large areas which result in low spruce volumes per acre. They are mostly inaccessible. Logging action in these areas is not proposed at this time due to extremely high road construction costs and low spruce volumes.